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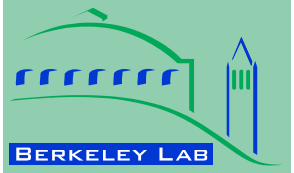

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Learning from Experience: Administrative and Programmatic Lessons from Clean Energy Funds

***** Internal Report – Not For Citation or Distribution *****

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Disclaimer

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Abstract

A number of states have recently established clean energy funds that target their support towards renewable energy. These funds were often developed with a common goal: to help protect, preserve, and grow nascent renewable energy markets. Many – but not all – of these funds were established in states that were opening their electricity market to retail competition. Funding is most commonly received through a nonbypassable charge on consumer electric bills, but funding has also been provided via lump-sum transfers through state legislation and merger settlements.

These state funds have already had positive and significant effects on renewable energy markets. Many of these successes and lessons learned have been highlighted in previous Berkeley Lab reports. At the same time, it is apparent that these funds have also encountered administrative and programmatic challenges, and that the funds are learning from these experiences and are continuing to improve upon their administrative processes and programmatic offerings. Growing pains are to be expected given the unprecedented scope and scale of these state programs.

This study analyzes some of the challenges that state clean energy funds have encountered, and steps taken to remedy those challenges. These "pitfalls" are grouped into two categories: administrative and organizational pitfalls, and programmatic pitfalls. Information was derived almost exclusively from a telephone survey of the administrators of the clean energy funds; we ultimately received input from 20 individuals representing 21 renewable energy funds.

The funds cited the following issues most frequently as posing significant challenges to date:

- number of high-quality project proposals (12),
- staffing and expertise (12),
- creating sustainable markets for photovoltaic systems (10),
- interactions with outside stakeholders (9),
- establishing guidance for fund allocation decisions (7),
- cost of distributed generation, and developing cost controls (7),
- political intervention and funding raids (6),
- establishing metrics and measuring success (6),
- collaboration with other similar funds and the U.S. Department of Energy (6),
- growing the green power market (6),
- relationships with public utilities commissions (4),
- integration of marketing and education support with program roll-out (4).

Fund administrators also noted the natural tension between putting megawatts of renewable energy in the ground in the near-term, and market transformation activities that aim to build a sustainable and long-term market for renewable energy.

We emphasize again that the explicit purpose of the survey was to identify challenges that have been faced by the funds. The existing clean energy funds have already begun to learn from many of these experiences, have responded to early lessons learned, and are having a significant effect on the renewable energy market. This document may therefore be of most use to newly established funds that wish to benefit from the lessons learned by their counterparts.

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1. Introduction

1.1 A Clean Energy Fund Success Story

A number of U.S. states have recently established clean energy funds to help support the growth of renewable energy markets. These funds are most often financed through nonbypassable charges on consumer electric bills, often called a system-benefits charge (SBC), but funding has also been provided via lump-sum transfers through state legislation and utility settlements. These funds have typically been developed with a common goal: to help protect, preserve, and grow nascent renewable energy markets that many feared would be in jeopardy as the electricity industry was restructured. Accordingly, many – but not all – of these funds have been established in states that opened their electricity markets to retail competition.

Slated to collect more than $3 billion from 1998 to 2012 for renewable energy investments, these clean energy funds will have a sizable long-term impact on the renewable energy market. In fact, the clean energy funds have already had a positive and significant impact on markets for renewable energy technologies. A significant majority of the grid-tied photovoltaic (PV) market in the United States, for example, is directly attributable to incentive programs in California, New Jersey, and other states, and clean energy funds have played a prominent role in opening up markets for new wind projects in the Northeast and other locations. Berkeley Lab has published a large number of reports and case studies that describe some of these successes in detail, and these documents should be read in concert with the present study.[1]

1.2 Report Objectives

Though clean energy funds have had substantial success in growing renewable energy markets, it is also apparent and not surprising that these funds have also encountered some administrative and programmatic challenges, and that the existing funds are learning from these experiences and are improving their administrative processes and programmatic offerings. Early growing pains are to be expected given the unprecedented scope and scale of these state programs. This is because renewable energy programs administered by the clean energy funds encompass a wide variety of support mechanisms, such as financial incentives to large-scale renewable energy generation projects; consumer financing programs; project and company financing; support for green power markets; rebates and buy-down incentives for distributed generation; and grants for business development, studies, workshops, conferences and other activities. Different administrative structures and processes are also in place in each state, and for some of the organizations tapped to administer these funds, this was a new responsibility and expertise in the development of renewable energy markets had to be gained.

In the context of reporting not only the successes of these funds, but also some of the challenges that they have faced and lessons that have been learned, this study highlights the "pitfalls" that state clean energy funds have encountered since beginning operation, and steps taken to remedy those challenges. These pitfalls must be considered in the context of the clear successes achieved

[1] See: http://eetd.lbl.gov/ea/EMS/cases/EMS_case.html.

by these funds individually and as a group, and we therefore urge readers to also review the positive experiences as reported in a series of other Berkeley Lab case studies and report.

Pitfalls discussed in this report are grouped into two categories: administrative and organizational pitfalls that focus on fund start-up issues, and programmatic pitfalls that encompass program implementation issues. Information was derived almost exclusively from a telephone survey of the administrators of the clean energy funds conducted in 2002 and 2003.

Our hope is that this study will help clean energy funds continue to learn from each other's experiences. We emphasize again that the explicit purpose of this report is to identify some of the early challenges that have been faced by the funds. The existing clean energy funds have already learned from many of these experiences, have responded to early lessons learned, and have already had a significant effect on the renewable energy market. This document may therefore be of most use to newly established funds that are also seeking to stimulate productive investments in renewable energy technologies, and that wish to benefit from the lessons learned by their counterparts.

2. Interview Methods

Information on administrative and programmatic challenges was derived almost exclusively from a survey of clean energy fund administrators. The survey was intended to identify the administrative, organizational, and programmatic "pitfalls" that have been experienced by newly created clean energy funds in the U.S., as well as what these funds have done to overcome these challenges. Administrative and organizational pitfalls focus on start-up issues (the first 6 months or longer), while programmatic pitfalls have no time limit.

Our approach to collecting this information was through an e-mail survey and follow-up telephone interviews. We distributed the brief e-mail survey to 21 clean energy funds in the United States (see Table 1). Telephone interviews were subsequently scheduled in which to go over the funds' experiences. The survey was conducted during two different time periods between April and June 2002, and between January and May 2003.[2] In almost every case, the survey was distributed to senior managers of each fund who had been involved with the funds since their inception.[3]

The survey/interview instrument that we employed was a basic one, with two general questions asked of each fund administrator: one question on organizational and administrative pitfalls and remedies, and the other on programmatic pitfalls and remedies. These questions were open-ended, allowing the respondent to openly discuss the most pertinent problems that his or her fund has experienced, and the remedies used to overcome the pitfalls. A copy of the e-mail survey is reproduced as Text Box 1. Because most of the surveys took place over the phone, we were able to follow-up on topics that seemed most pertinent. Individual interviews typically ranged from 20 minutes to a whole hour.

An important objective of the survey was to elicit truthful and complete responses to organizational, administrative, and programmatic challenges faced by the funds. To ensure such open responses, we provided a promise of confidentiality on administrative and organizational pitfalls – no individual fund or survey respondent is therefore identified in our discussion of administrative and organizational pitfalls, below.

Our survey and interview requests ultimately yielded positive responses from every fund (we interviewed 20 individuals, representing 21 funds). All but two of these surveys were conducted by phone, with one fund providing a draft report that summarized pertinent information and another fund manager being interviewed in-person.

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[2] Interviews conducted during the first phase of April to June 2003 were targeted at developing lessons learned for the Energy Trust of Oregon; we conducted interviews with additional state clean energy funds between January and May 2003 to provide comprehensive results.

[3] The survey was not distributed to: (1) state energy offices that fund renewable energy projects with revenue sources that are not derived from a SBC, and that have been in existence for some time; (2) utilities that administer internal renewable energy funds such as LIPA and California's municipal utilities; (3) Arizona, which has a system-benefits charge that is used to help fund the utilities' renewables portfolio standard obligations; or (4) The District of Columbia, which recently established an SBC that may fund renewable energy projects, but has not yet done so.

Table 1: State Clean Energy Funds That Include Renewable Energy

Fund (state)	Approx. Yearly Funding for RE (million)	Organizational Type	Type of RE Funding
CA Energy Commission (CA)	$135	state agency	incentives
CPUC DG Program (CA)	$100	state agency/utilities/city energy office	incentives
Connecticut Innovations (CT)	$25	quasi-public	investments/ incentives
Delaware Economic Development Office (DE)	$1 (maximum)	state agency	incentives
IL Dept. of Commerce and Community Affairs (IL)	$5	state agency	incentives
Illinois Clean Energy Community Foundation (IL)	$2	non-profit	incentives
City of Chicago (IL)	$0.5	city agency	investments/ incentives
Massachusetts Technology Collaborative (MA)	$20	quasi-public	incentives/ investments
Xcel RE Fund (MN)	$16	utility with environ. collaboration	incentives
Northwestern Energy RE Fund (MT)	$1	utility with environ. collaboration	incentives
BPU/Dept. of Environ. Protection (NJ)	$35	state agency	incentives
NYSERDA (NY)	$14	quasi-public	incentives
OH Dept. of Develop. (OH)	$15 (portion of)	state agency	investments
Energy Trust Of Oregon (OR)	$10	non-profit	incentives
The Reinvestment Fund (PA)	$5	non-profit	incentives/ investments
Berks County Community Foundation (PA)	$1	non-profit	investments/ incentives
Community Foundation of the Alleghenies (PA)	$1	non-profit	investments/ incentives
Sustainable Energy Funds of Central Eastern PA (PA)	$3	non-profit	investments/ incentives
West Penn Power Sustainable Energy Fund (PA)	$2	non-profit	investments/ incentives
RI State Energy Office (RI)	$3	state agency	incentives
Dept. of Administration/RE Indep. Administrators (WI)	$4	state agency/contractors	incentives

Text Box 1: Renewable Energy Pitfalls Survey

Dear [fund administrator]:

I'd like to ask for your help. As you may know, Lawrence Berkeley National Laboratory, in conjunction with the Clean Energy Group, published a report in September 2002 entitled Innovation, Renewable Energy, and State Investment: Case Studies of Leading Clean Energy Funds. See http://eetd.lbl.gov/ea/EMS/cases/EMS_case.html for more information. The report identifies "best practice" programs and administrative structures from the state clean energy funds. The goal of the report was to identify program and practices that work, or those that promise to work, and therefore merit further investigation, adaptation, or emulation by other clean energy fund administrators.

Now, we wish to collect information from state clean energy funds about any organizational or programmatic pitfalls that have been experienced, and any efforts taken to remedy those pitfalls. For these purposes, "pitfalls" refers to unanticipated problems that arose in program or administrative activity. "Organizational pitfalls" refer to internal or external administrative issues. "Programmatic pitfalls" refer to the substantive programs you administer. This information is designed to improve the prospects for success for other state clean energy funds, as well as for states that are contemplating the establishment of clean energy funds.

We would like your assistance in obtaining the following information:

- Organizational pitfalls experienced in the start-up phase of your fund (6 months or longer), and actions taken to overcome those pitfalls; and
- Programmatic pitfalls experienced, and actions taken to overcome those pitfalls.

We ask for your cooperation in this effort. We hope you can provide us frank responses to the questions below.

We realize that one important aspect of this kind of request is confidentiality. We want to obtain the unvarnished truth about program or organizational problems. But we are also realistic. We know that reporting some of these early problems could result in misuse of that information. We therefore propose the following confidentiality protection for this information.

Confidentiality Policy: We assume that information about the results of your programs is a matter of public record, and funds will be open to discuss program pitfalls with little hesitation. However, we see an important difference with organizational pitfalls – those internal or external organizational issues that could raise personnel, political, or other problems if used inappropriately.

Therefore, in any of our reports on organizational issues, we commit to not identify any fund by name and we will only report generic pitfalls. To ensure your comfort with this arrangement and the way we have portrayed your reported pitfalls, we will forward you a draft of any report for comment prior to public release. We hope these protections will give you the security you need to share your insights with us.

Text Box 1: Renewable Energy Pitfalls Survey (continued)

With these protections, we ask you to help us obtain the following information:

1. We are particularly interested in any organizational or administrative pitfalls that you feel your clean energy fund has run into during its start-up phase (defined here as the first 6-months or longer), and the remedies that you have used to overcome these pitfalls.

   Such pitfalls may relate to staffing (levels, responsibilities, expertise, training, staff support, etc.); organizational structure (basic form of organization, board composition, management structure, advisory committees); organizational policies (mission, decision-making rules, criteria for evaluating programs or investments, project tracking and quality assurance, manner in which proposals are solicited and received, etc.); limitations on fund activities or investments; interactions between boards, advisory committees, and staff; interactions with and input from outside stakeholders; use of consultants, etc.

   Please identify up to 5 of the most important organizational or administrative pitfalls that your fund has experienced in its start-up phase (6 months or longer), as well as the remedies used to overcome these pitfalls.

2. We are also interested in any programmatic pitfalls that you feel your clean energy fund has run into since its inception (i.e., not limited to the start-up phase), and the remedies that you have used to overcome these pitfalls.

   Such pitfalls may relate to the types of renewable technologies and applications that you have targeted, the type and structure of RFPs that you developed, the projects that requested funding, due diligence requirements, and program results.

   Please identify up to 5 of the most important programmatic pitfalls that your fund has experienced, as well as the remedies used to overcome these pitfalls.

I will be calling you in the near future to set up a time to discuss these issues by phone. If you would like to send us the information by email, please send this information to me at porter@exeterassociates.com; or, feel free to call me at 410-992-7500.

We look forward to discussing these issues with you. We hope and expect that what we learn will be of value to your and other clean energy funds, so your cooperation could well benefit your future implementation. Thanks for your anticipated assistance.

Thanks,

Kevin Porter

3. Survey Results: Administrative, Organizational, and Programmatic Pitfalls and Remedies

3.1 Introduction and Summary

This section highlights the results of our efforts to collect information on administrative, organizational, and programmatic challenges faced by the clean energy fund, and remedies already taken to address some of those challenges. This discussion is limited to only those pitfalls and remedies relayed to us by the 21 clean energy funds; we simply report on what we heard in each interview, without making value judgments on the importance of different comments that were made.

Though the underlying issues overlap considerably, we relate our findings in six broad categories:

- Legislative and Regulatory Issues
- Organizational Structure
- Organizational Policies
- Interactions with and Input from Outside Stakeholders
- Staffing Levels and Staff and Board Expertise
- Programmatic Issues

To provide a benchmark for the relative importance of different issues, the number of funds that mentioned each issue is highlighted in parentheses. The funds cited the following issues most frequently as posing significant challenges to date:

- number of high-quality project proposals (12),
- staffing and expertise (12),
- creating sustainable markets for photovoltaic systems (10),
- interactions with outside stakeholders (9),
- establishing guidance for fund allocation decisions (7),
- cost of distributed generation, and developing cost controls (7),
- political intervention and funding raids (6),
- establishing metrics and measuring success (6),
- collaboration with other similar funds and the U.S. Department of Energy (6),
- growing the green power market (6),
- relationships with public utilities commissions (4),
- integration of marketing and education support with program roll-out (4).

3.2 Legislative and Regulatory Issues

Several funds identified challenges that emerged from their enabling legislation or regulation, or from changing political circumstances.

Political Intervention and Funding Raids (6). State clean energy funds are proving to be a tempting target for governors and state legislators coping with strapped state budgets. At least six funds reported being the target of legislative or gubernatorial "raids" in support of balancing deficit-ridden state budgets.[4] Many of these same fund managers also believe that their funds will face similar, continued threats in the future. Because nascent renewable energy markets cannot easily withstand uncertainty and stop-and-go funding, continued budgetary threats are likely to be an ongoing concern of state fund administrators.

- One fund manager noted that political leaders are impressed by the mission and accomplishments of that state's renewable energy programs, but still view the funding as just another pot of money to draw upon if necessary to balance the state budget.
- Another fund manager successfully negotiated what is effectively a loan from the fund to the state budget, in return for future state purchases of green power; but even this fund manager is worried that the next potential raid may be larger and without a guarantee of any pay-back.
- A third administrator reported that the threat of funding raids is preventing them from effectively planning and implementing program activities.
- A fourth fund manager reported success in protecting project-oriented funds from legislative raids, although funding for the administration of the program is still at risk. Even this fund manager recognizes that this temporary success is subject to change, however, and he noted that legislators in his state have said that "nothing is sacred."
- In a fifth case, a manager indicated that during periods of budget crunch, some governmental officials do not want to publicize or advertise the existence of the renewable energy program, presuming that such announcements would raise political problems with those more interested in other issues. This limits the fund's ability to appropriately market its programs.
- In a final case, an interviewee noted problems that occur when there are changes in state political leadership. Specifically, programs that are proposed in the last year of any administration may suffer from lack of continuity and lose support as officials leave the government.

Renewable Resource Eligibility (3). Three fund managers identified a problem inherent in their funds' enabling legislation: a lack of clarity in the eligibility of certain kinds of renewable energy sources.

- *Customer-sited generation definitions:* The legislation creating one fund specified that the administrator was to target "customer-sited" applications. Lack of clarity on the definition of a "customer-sited" facility, however, has created some implementation problems. The agency decided to define an eligible facility as one that uses at least half of the generation for onsite

[4] It should be noted that half of our interviews with clean energy fund managers were completed before state budget problems became commonplace, so the level of importance ascribed to this pitfall may be understated by our interviews.

purposes, but questions continue to arise about the implementation of this eligibility decision (for example, what is a "customer" and must load and generation be co-located on the same site?).

- *Biomass definitions:* Another fund struggled to define eligible biomass given a vague "sustainability" criterion established in the fund's implementing legislation. The agency had to engage in a lengthy rulemaking process to determine what specific criteria it would use to screen eligible projects. An interim policy defined the relevant terms, though the fund still ran into quasi-legal disputes about which technologies qualified for support given the vague statutory language. This lack of clarity in legislation was also used by the proponents of competing technologies to argue that certain biomass applications should not be supported.
- *Treatment of thermal applications:* One administrator struggled with how to treat thermal applications of renewable technologies (e.g., solar water heating and biomass heating). The solution was to require a fixed percentage of energy efficiency funding to be applied to thermal programs (4% of energy efficiency funding was dedicated to thermal load programs). However, this solution in turn created problems by segmenting the role of the energy efficiency and renewable electricity contractors, creating an extra layer of program bureaucracy that adds to transaction costs.

Limited Funding Options (3). Some funds reported that either overly strict legislative requirements, or simple geographic restrictions, limited program flexibility. One fund manager noted that the state's small size restricted funding opportunities, particularly for new renewable energy and fuel cell installations. Another program manager lamented that the small amount of money in the fund, and the planned expiration of the fund within a few years, has forced them to focus on near-term opportunities and to minimize risk. The pending expiration of the fund apparently precludes subsidizing large-scale renewable generation projects such as wind, or residential PV programs. The fund manager also reported that there were several areas they would like to explore, such as insuring the value of green certificates, but that these opportunities would not be pursued unless the fund is extended and/or supplemented with additional funds. A third program manager said that state legislation limited the fund's activities to participation in bank loans, making loan guarantees, and or doing linked deposits. For various reasons, each of these options has proven difficult to implement effectively. The fund has therefore asked the state legislature to grant them authority to make direct loans.

The Desire for (and Curse of) Long-Term Funding Certainty (3). Two funds expressed the need for longer-term funding certainty to build sustainable markets for renewable technologies. The initial funding for one of these funds was of short duration, leading to a "get the dollars out the door" mentality that, to some extent, impeded the creation of programs that might lead to long-term, sustainable markets. Subsequent extension of the system-benefits charge has allowed for a more thorough consideration of the underlying barriers to renewable energy demand and has provided the administrator an ability to more carefully target its funds toward the creation of sustainable markets. This has included targeting green power demand initiatives, as well as interconnection barriers and niche applications for photovoltaic installations.

Another fund identified a downside to long-term funding certainty: such certainty may not create the right incentives for positive, near-term action as fund managers have the luxury of "taking it slow" with little risk because funds will continue to flow in. One way to address this is to create

specific, closed-ended funds within the larger fund, each with set expiration dates. This may force the development of goals, milestones, and early, aggressive action.

Siting and Permitting Barriers (2). One fund manager expressed frustration with the barriers to siting and permitting renewable energy projects in his state, and lamented that the legislature did not address these issues when they created the fund. As it is, one hand of the state government (siting and permitting agencies) is undermining the other (the state renewables fund). At least one way to deal with this problem is for the fund administrator to provide objective information to lawmakers about the negative effects of these siting and permitting obstacles. Another fund noted that its state's formal permitting process only addresses thermal plants, and only those over 50 MW. In essence, the fund could not require siting approval as a funding condition for non-thermal renewable energy projects over 50 MW, or any renewable energy project under 50 MW in size. As a result, the fund could not easily evaluate which renewable energy projects were likely to be successfully sited, and therefore should be funded.

3.3 Organizational Structure

Several fund managers also identified a range of challenges that have been faced due to the structure of their organizations.

Relationships with Public Utilities Commissions (4). One of the non-profit clean energy fund administrators noted that the fund's relationship with the utility oversight board has proven to be a delicate and complicated one, and that lines of authority have rarely been clear. The utility commission has sometimes become the safety valve for complaints about the funding process, and has been the focal point for political and regulatory activity to influence or overturn fund decisions. A more formal and regular reporting of fund status and the development of guidelines to control the process has been found to be helpful. Another administrator, however, has found that the PUC's formal reporting requirements are more burdensome than needed, and that a simpler and less exhaustive reporting process would be sufficient. Yet another fund administrator reported that the PUC would not allow the fund to cover the costs of his time, necessitating a transfer of job responsibilities away from administering the fund. Finally, one administrator noted a dual relationship with the PUC, with the PUC an ally but also responsible for oversight of the fund. In addition, this administrator said that clean energy funds need to take some risks, but the PUC is risk averse, leading to some tension between the two organizations.

Utility Administration of Clean Energy Funds (3). At least three states have struggled with utility administration of their renewable energy programs. In one case, considerable conflicts were created or claimed with utility involvement in program administration. An independent evaluation of the program resulted in a recommendation to shift responsibility away from the utilities. Formal program reporting requirements have also been established to ensure that informed oversight of the utilities' effectiveness occurs. In another case, dissatisfaction with utility administration has not been great but there has still been some desire to explore alternative administrative structures. In a third state, there have been concerns that the utility administrators were not initially knowledgeable about distributed generation technologies and worse, were sometimes hostile and resistant towards incorporating distributed generation. There have also been concerns that the utilities underestimated their responsibilities, as staffing levels were

initially inadequate, and that utility due diligence requirements and concerns over potential regulatory disallowances prompted excessive legal review. Ultimately, some of the administrative requirements for this fund were outsourced, considerably alleviating these concerns.

Unclear Administrative Responsibilities (3). Three states noted that a key pitfall has been unclear administrative responsibilities. In one state, two different administrative offices have some oversight authority over the fund. This has complicated the process, and slowed down the approval of funding applications. In another state the fund manager is overseen by a number of different supervisors, which makes decision-making and planning difficult. A final state, which out-sources much of its administration to other organizations, has struggled to develop a clear set of underlying rules for decision making among the various organizations. The fund manager recommends that such rules be established early in the process.

Transitional Issues: Moving Away from Utility Administration (1). One agency suffered through several transitional issues in transferring programs and responsibilities from the utilities to the newly appointed government administrator of the system-benefits charge programs. These transitional problems were most apparent for energy efficiency programs where a more developed market and pre-existing set of programs existed. Fortunately, the renewable energy programs did not face as challenging a transition because there were few pre-existing programs with which to coordinate and there was no significant renewable energy infrastructure in place.

3.4 Organizational Policies

A broad array of challenges that relate to organizational policies was highlighted by those interviewed.

Establishing Guidance for Fund Allocation Decisions (7). Issues associated with fund allocation were mentioned by a number of administrators.

- *Fund allocation by technology:* Seven funds noted the need to establish guidance early on for the allocation of funds across technology groups. Without this, conflicts will surely arise.

  - In one case, early efforts to suggest such allocations failed to gain approval because not enough was known to do so and issues of legal authority were raised. The result, however, has been a host of charges by the PV industry that they have not been sufficiently funded, creating a major retrenchment of funding for other technologies.
  - A second fund manager told a similar story: each stakeholder is passionate about his or her specific technology, but with funding limits, this manager has found it difficult to split funding in a way that keeps everyone happy. He noted that the best one can do is to achieve a "truce."
  - Another fund initially considered but decided not to allocate renewable energy funding by technology. With few proposals offered in its first solicitation, the fund now believes that it should allocate funding amounts at the beginning of the year or at least develop soft targets for internal use.

- With no explicit allocations included in the enabling legislation, another noted that it has continued to struggle with allocating funds among renewable energy, energy efficiency, and low-income customer assistance programs; yearly competition for funds is reported.
- Another fund administrator lamented that they could have done a better job at expressing their technology and proposal preferences in their first RFP, and indicated that they plan on making the needed changes in subsequent RFPs.
- A final fund, however, strongly recommended that such allocations not be overly stringent to ensure a level of flexibility in adjusting funding levels over time.

In conclusion, it is evident that it takes time, effort, and negotiation to allocate funds across technology groups, and that it is rare for all parties to be happy about the final allocations. Nonetheless, most of the funds that we interviewed believed that making such allocations up-front, and early in the process, is important.

- *Aggregate and per-project funding limits:* One fund noted that they have a limited amount of money in aggregate, and have also established a low, per-project funding limit, significantly limiting project opportunities. One option they are pursuing, given this circumstance, is to limit program implementation to specific geographic areas (e.g., focusing on one technology in one town, and going deep to develop infrastructure in that community, reduce transaction costs, and develop a value chain). It is expected, however, that this approach could create political problems. Another fund established a program to fund feasibility studies, with a low per-project funding limit. Because the funding cap was found to not be high enough to attract quality proposals, the limit was subsequently raised. In a final case, a fund administrator observed that some applicants in the first round of funding requested most or all of the available funds. Because the administrator wants to fund a diversity of projects, future solicitations may include maximum buy-down levels for different technologies as well as a per-project funding cap.

- *Funding limits by organization and organization type:* One organization is faced with a nonprofit structure that prevents it from funding private sector companies – its funds were from a charitable contribution from the utilities, not from a system-benefits charge. One way it has tried to overcome this constraint is through government partnerships, where it funds a government entity that can enter into private sector transactions. Another organization considered per-company funding limits to ensure a large number of fund recipients, but decided against such a limit so as to not punish the most successful organizations.

Establishing Metrics and Measuring Success (6). Many fund administrators noted the challenges of establishing the most effective metrics and measuring the success of their programs. Several interviewees noted that the most politically appealing metric of success is typically installed renewable energy capacity. But, this metric can be at odds with "market transformation" programs that may call for lower direct subsidies and more infrastructure building activities. Such market transformation programs are typically of a much longer-term nature and require patience and a more complex approach to program evaluation. Failure to clearly resolve these issues can make ongoing progress difficult to measure and evaluate, and subject the fund to political pressure based on inappropriate success metrics.

Another fund manager noted the tension between energy production and industry building. This manager indicated that his state has several wastewater treatment plants, but only a handful are large enough to use the smallest available reciprocating engine. This fund manager would like to find a way to build demand for smaller engines in order to capture the methane gas from smaller wastewater treatment facilities, but this requires an "industry building" approach that may not lead to immediate results.

One fund manager specifically mentioned the need to learn from the energy efficiency evaluation community on how to develop appropriate market transformation metrics to use in the renewable energy field. Another administrator noted the need for more rigorous standards to evaluate success. The lesson noted by this fund manager: take control of the measurement and evaluation process early on.

Clarity of Mission and Goals (2). Two funds strongly emphasized the need to have a clearly stated mission from the beginning. In one case, there was a need to highlight the fund's role as one of building "sustainable" markets and not one of simply providing ongoing subsidies to "deserving" industries. The interviewee noted that their agency did not deal with this effectively up front: it did not develop technology funding allocations or establish clear guidelines to form the basis for rejecting project applications that did not meet the organization's mission. As a result, various stakeholders were not certain of the direction of the fund, leading to damaging miscommunication.

In addition, two other interviewees emphasized the need for an administrator to clearly establish its role in the market. Is it solely a grant-making agency? Is it some form of honest broker to help settle project disputes? Is it an economic development agency that will look to in-state project support first? Is it an agency that is there to help existing renewable industries get more of the economic development pie? Is it an advocate for a particular form of clean energy development? Confusion over the public role of the administrator can lead to political disputes with affected constituencies, and lead to confusion among fund staff and management on how to evaluate proposals and build programs.[5]

Competitive Solicitations vs. Unsolicited Proposals (2). To reduce the role of politics in funding decisions, several funds have focused on the use of competitive solicitations. In one case, a fund will only consider unsolicited proposals on a case-by-case basis if a unique opportunity arises between solicitations. Another fund indicated that competitive solicitations are best used for grant awards in areas where such subsidies can be justified, but that a less structured process is appropriate when a fund is trying new endeavors or moving into new technology areas where it does not have a clear policy. In those cases, more flexible, non-competitive offerings may be superior.

Determining How to Book Multi-Year Grants or Incentives (2). Two funds expressed concern about how to deal with multi-year funding awards. One fund manager indicated that his

[5] On a related matter, one fund noted that confusion about rate-of-return expectations can complicate program development. That is, the fund should know upfront whether it wants any financial return on its investment and, if so, at what rate and over what time period.

fund presently books grants in the year in which the proposal is accepted so all funds are encumbered in year one. The fund manager noted that his fund continues to struggle with how to encumber grants using expected future funds. A second fund indicated that it cannot enter long-term financing commitments without encumbering significant portions of the fund for many years. This means, for example, that the fund cannot enter into long-term contracts for green tags to facilitate the financing of renewable energy projects. One possible solution, which would require legislative approval, would be to allow the fund to float bonds that would be backed by encumbered funds. In this case, the fund could make long-term commitments now based on proceeds from the bond issuance. The cash from of the ratepayers would then serve as the revenue to support repayment.

Project Tracking Barriers (1). A concern raised by one fund was the need to develop a comprehensive database in which all contractors have access to information about homes and businesses contacted, and history of contacts with the agency. This administrator initially had several major contractors going to various institutions and did not have in place a coordinated database to track these contacts. Apparently, an internet-based database created by the Vermont Energy Investment Corporation for "Efficiency Vermont" serves as a good model of what is needed.

3.5 Interactions with and Input from Outside Stakeholders

Interactions with and input from outside stakeholders can be valuable, but has also proven to be problematic for a number of the funds interviewed.

Interactions with Outside Stakeholders (9). Many states specifically emphasized the need to cast a wide net and seek input from outside stakeholders.

- In one case, an interviewee noted that their fund initially developed a business plan that did not educate and involve stakeholders adequately. In this case, the administrator outsourced the development of its business plan and strategy. As a result, stakeholders objected to the business plan, and the organization had to re-engage with all of the players to revise and re-develop the plan again.
- Another interviewee told a similar story, and emphasized the need for fund managers to directly solicit input from industry and not work through consultants to do so.
- A third interviewee said industry input is essential, and while industry groups clearly want as much money as possible, a program cannot be designed effectively without them. The same interviewee said it is also vital to communicate with funding recipients about what is working and not working, and to incorporate that feedback into program design.
- One of the utility-administered funds realized that the consequence of perceived inappropriate fund expenditures would be dire, and therefore established an inclusive advisory committee.
- Another fund manager said there are not many stakeholders in the state, and the potential for conflict of interest is high. This fund manager said there has to be a high level of trust on all sides, as funding applicants must supply sensitive data to the fund, and the fund manager must trust the applicant's consultants, among other things.

- In a final state, a PV incentives program was announced several months before applications could be accepted, leading to industry and consumer confusion and delays in industry development. The fund administrator indicated that they had learned from this experience, and now realizes that greater industry input should have been sought in advance.

While interacting with outside stakeholders is clearly productive, several funds also mentioned the challenge of engaging these stakeholders without being unduly influenced by their desires. One fund noted that state fund managers must make their agenda clear, while also emphasizing that they have a broader agenda than the specific industry players. Another fund mentioned that allocating funds by technology early in the process could reduce these conflicts though, as discussed earlier, making such allocation decisions is not always easy. Still another fund noted a tension between industry wanting to put hardware and megawatts in the ground and a fund that wants to deliver energy.

Collaboration with Other Similar Funds and the U.S. Department of Energy (6). Several administrators noted the value of working with and learning from similar funds from other jurisdictions – both domestically and internationally. Indeed, multiple fund managers reported regular strategic planning with other nearby fund programs. One fund, in reviewing its program experience, expressed regret that they had not worked more closely with neighboring state funds, believing they may have leveraged funding and project opportunities more successfully had they done so. One of these funds also noted the potential value of working with the U.S. Department of Energy (DOE), though this fund also related the challenges it had faced in making connections with the DOE. Two funds expressed interest in seeking co-funding from the DOE to leverage their own program dollars.

Conflicts of Interest in Decision-Making (3). Other funds noted the challenge of involving outside stakeholders while managing the resultant conflicts of interest that can arise. In one fund's case, the interviewee noted that committees set up to provide general advice have acquired effective "veto" power over decisions that the administrators had expected to make themselves. This fund manager also said that placing existing industry spokesmen on committees can be problematic, because industry representatives typically emphasize the role of heavy subsidies over other programmatic approaches. This fund further noted that it continues to struggle with how to balance these forms of advice while still providing for innovative and flexible program design.

In another case, a fund administrator reported that involving industry or non-profit representatives in decision-making roles on grants can create problems with conflicts of interest even when those institutions are not directly involved in the specific grant applications; the same sorts of problems reportedly arise when such representatives are involved in approvals for business or operating plans. The same interviewee noted that these issues are often not resolved satisfactorily even with standard conflict of interest disclosures and recusals. In this fund's experience, leadership on the board is required to cull out these problems; staff should not be asked to lead this process. One possible solution that was raised is to go to regional or national players for advice because these parties may not have parochial interests in the technology or a stake in the financial health of any particular project.

Due Diligence and Proposal Evaluation (3). Three of the interviewed funds identified the need for outside, technical due diligence assistance. One fund specifically noted that this assistance is especially useful in confirming or vetting specific industry projections of technical or financial capabilities. These issues often stretch staff expertise, and are very sensitive to ever-changing industry activities that staff may have a hard time staying on top of. Another fund mentioned that the use of outside technical experts can reduce the political pressure to fund unworthy projects. The use of business school interns for financial analysis has apparently been productive for one fund. Another fund has benefited by co-investing with another institution that has equal or superior investor skills to do the due diligence work on a specific project. The experience of one fund suggests that alliances with local venture capital or other firms, or government investors is a key to successful due diligence of projects.

3.6 Staffing Levels and Staff and Board Expertise

Staffing and Expertise (12). A large number of funds indicated that insufficient staffing, and inadequate staff expertise, has hindered their efforts. This appears to be especially the case for government agency administrators of clean energy funds, which are often more constrained in hiring new staff.

- One administrator said that state budgetary problems have made it impossible to fill vacant staff positions and, consequently, have made it difficult to process funding applications and to track projects in a timely fashion. Another fund manager noted that staffing levels were clearly insufficient to do the job required by the funding needs. This pitfall was compounded by a hiring freeze that made it impossible to bring in more staff to run the program.
- Two additional funds also faced critical staffing shortfalls, and found that the volume of project proposals required the funds to hire outside contractors to run certain programs; one of these funds noted that it was lucky to find very dedicated, qualified contractors to take on this administrative burden.
- A fifth fund echoed these points and considered automation techniques to handle a surge in customer applications, but determined that automation would be ineffective, as each application is unique and requires a lot of customer interaction. Another fund also explored automating, to some degree, proposal evaluation and responses but found that too much customer interaction was necessary, and opted instead to rely on interns.
- Still another fund noted that it benefited from a capable pre-existing organization that already had good staff, and that was able to attract high-quality additional staff to fill in the gaps.
- Yet another fund said its lack of expertise in renewable energy was a hindrance, and made it difficult to sort out high- and lower-quality funding applications. One interviewee stressed a similar point, and said that it is difficult to keep up with developments in each individual renewable energy technology; this manager regretted being forced to cut back sharply on analysis activities, saying that a lack of awareness of renewable energy market development and industry participants is hampering the program's effectiveness.
- Another fund manager stressed the need to leverage projects with the most impact, given inadequate staff resources, while a different fund manager lamented that it is difficult for a fund to have "staying power" if there are not enough staff to do the work.
- One of the funds made a somewhat counterintuitive point: having fund managers or staff with prior renewable energy experience can present problems if that staff comes into the job

with preconceived notions about technologies, markets and commercialization paths. In this fund's experience, having staff with no pre-existing views on renewable energy can be a benefit to creative program development. Another fund made the diametrically opposite point, however, noting that a staff experienced with renewable energy issues is an essential ingredient to success.

Board Expertise (3). One fund highlighted its struggles in working with a board whose members do not hold common levels of expertise in renewable energy, noting that a board that has little background in energy issues will hinder progress. The administrator described the need to educate its board to the statewide significance of its programs, and to reduce or eliminate parochial concerns. The interviewee also highlighted the need to have board members consider overall programmatic issues, and to not become overly involved in day-to-day management. Another administrator said that the fund's board has little executive experience and tends to micro-manage. A third fund, however, indicated that it has benefited from being in an existing community foundation, where the governance structure was already in place and the clean energy fund could therefore get off to a fast start.

Funding Level Sticker Shock (1). One fund manager noted that nonprofit decision-makers often suffer "sticker shock" when reviewing projects that involve substantial fees for profit-making ventures. In this case, the management and board of the nonprofit organization had to be educated about for-profit fee and profit structures so objective evaluation of project proposals could proceed.

3.7 Programmatic Issues

Funds also called attention to several programmatic issues, as discussed below.

Number of High-Quality Proposals (12). A number of funds expressed disappointment in the quantity and quality of project proposals that they are receiving. This despite these funds' initial predictions of being inundated with a suitable quantity of strong project proposals. At least two funds further noted that good proposals for small projects come in at a pretty steady pace, but that high-quality proposals for larger projects have been harder to come by.

One fund specifically noted that the NGO community is not project-oriented, so the fund's natural allies are not developing projects worthy of support in large measure. To counter this early experience, this fund now place more emphasis on outreach, proposal creation, and infrastructure-building activities. Another fund manager was surprised at not only the lack of proposals, but that in his fund's case, there were few proposals for certain "established" renewable energy technologies. A separate fund manager believed that renewable energy technology vendors oversold the performance and cost of their technologies, and that siting challenges in the state only compounded things.

States are taking efforts to counter these concerns. At least three fund managers noted that they have decided that aggressively looking for more and better projects to fund is simply part of their job, and that aggressive outreach to find good projects is a necessity. These three fund managers have taken to networking extensively in order to find good projects to support. One fund also

reported that it is now contracting for outside assistance with programmatic outreach and education; this fund manager reported that this is especially important if one is relying on debt and equity investment tools and is less important in a standard grant-based program. Another fund has considered providing capacity-building grants to small groups to enhance their ability to develop strong projects proposals (e.g., grants to cities for feasibility studies of renewable energy installations). Finally, two other funds have considered the use of bill inserts, print ads, and direct mailings to enhance their proposal pool.

Creating Sustainable Markets for Photovoltaic Systems (10). Based on the results of our survey, stated programmatic challenges appear disproportionately common in the solar energy market. States are clearly still looking for new and innovative ways of building this market.

- One fund administrator indicated that he has found that PV companies do not have the time or resources to fully explore new markets for their technology, but rather chase markets that are heavily subsidized; it has therefore proven extremely difficult to focus the industry on "value" markets that may be more sustainable in the long term. This interviewee believes that states should work together to offset this effect.
- Another fund has found PV to be the toughest technology to expand at this time. The interviewee noted that a great deal of uncertainty exists about how to develop non-grant based awards for PV development. While there may be niche markets in which PV does offer a strong value proposition, this fund has been unable to engage these markets so far. The fund has also sought to integrate PV and DSM into low-income housing, with little success. Most of the problems relate to builder difficulties – delays and financing problems plague the low-income housing market and complicate efforts to incorporate renewables.
- One fund administrator indicated that the most attractive near-term market for PV is overseas, and he is therefore working on leveraging potential federal funding with his own funds to develop possible export opportunities for PV companies in his state.
- A concern was also raised that PV-based subsidies were having the effect of raising the price of installed PV systems. Still another program administrator reported that PV system costs were not coming down because of high labor costs. Two other fund managers reported that PV incentives were initially set too high, and that percentage caps on PV-buydown programs encouraged the padding of costs and did not provide adequate incentives for cost-cutting measures; these managers recommended that incentives be lowered and that percentage caps on funding be removed.
- Another fund manager reported that like many others, PV companies were initially bullish on a strong green power market emerging in response to electric restructuring, and asked for too little subsidy in the belief that customer demand would make up the difference. The PV companies' predictions on in-state PV installations did not materialize when green power demand did not grow as expected.
- Yet another interviewee emphasized the need to break institutional barriers, build the PV infrastructure, and enhance solar education before throwing sizable, untargeted grants at PV installations. In the case of this fund, initial efforts were placed on getting PV installed quickly. It rapidly became apparent, however, that interconnection barriers were serious and were causing frustration in the PV community. The fund is now shifting some of its focus to educational installations and the training and certification of installers, and believes that a fund cannot start early enough on PV infrastructure building activities. It is also apparent,

however, that different evaluation metrics will be required to monitor the success of these long-term initiatives.

- In contrast to the observations above, one fund administrator reported very strong demand for its PV incentives program, to the point of reallocating funds and staff from other programs to cope with the demand; high incentive levels, high electricity rates, and a reasonably strong PV industry contribute to this demand. This administrator wonders whether they have found a "magic moment" of matching the right incentive for PV with customer demand, or whether the fund was experiencing a high level of demand that may ultimately be short-lived. The fund administrator also noted that the PV industry is still beset by supply constraints and delivery choke points, however, and has had difficulty at times meeting the demand of the fund's programs.

Cost of Distributed Generation, and Developing Cost Controls (7). Some fund managers pointed out that certain eligible technologies such as PV and fuel cells have high public familiarity and support, but they are also the most expensive. This has created some challenges for the funds:

- *Funding Support:* Four of these fund managers have largely ruled out substantial funding support for these technologies because of fears that these investments would consume most of the available funds. Some fund managers said that they are unwilling to fund anything but renewable energy technologies that are close to market-ready. In other cases, states expressed interest in these technologies, but their high cost, combined with small state budgets, has kept these states from acting, at least for the time being. Stakeholders in one state are pushing hard for fuel cell installations, but the fund manager is concerned that fuel cell installations will consume most of the available dollars.
- *Setting the Incentive Level:* Another fund manager noted that his fund's photovoltaics grant program did not have a dollar cap, and the first photovoltaics installation was much higher cost than expected; a cap on the available grant has since been imposed. Yet another fund manager noted that if percentage caps are imposed, companies may be encouraged to pad costs in order to get a higher incentive payment. Inflated costs can be corrected with careful administrative oversight, but time constraints and administrative complexity makes this a difficult task. This fund also found that distributed generation encompasses many technologies that are at different levels of economic and technological status. The fund manager found that little data exists on installed costs for distributed generation systems, and that setting incentives at appropriate levels proved difficult.

Growing the Green Power Market (6). Despite some real successes, a number of fund managers also noted challenges in growing voluntary customer-demand for "green" power. One administrator was disappointed in the early returns from the fund's residential green power programs. He believes that the fund should not continue to ignore the potential for green power activity in the commercial and industry sector, which calls for a much different approach than the residential sector. Another fund administrator also expressed disappointment with the tepid results of his fund's green power program, despite efforts to market the program through a prominent grocery store chain. This manager believed that the green power incentive payment may not have been set high enough to create demand. Yet another fund manager reported that

the green power market is beginning to take hold after a slow start, and concluded that initial expectations for rapid development of the green power market may have been unrealistic.

Another fund initially focused on the installation of renewable energy projects as a supply-side initiative, but later recognized that the major barrier to development was the lack of demand for the projects' output. The fund has subsequently created a green power incentive program to build that long-term demand.

A separate fund has not been able to link in-state renewable energy development with state procurement of clean power. The complication stems from the difficulty in convincing the Treasury office that premiums are justified for such purchases. This fund has questioned which issue to tackle first: developing in-state renewables or changing state procurement practices. The interviewee believed that the initial focus should be on the procurement side because there is a clearly defined timeline for new contracts and authorizations, with in-state renewable energy development to follow based on obtaining procurement commitments.

A final fund noted that its state legislature and others do not appreciate the difficulty in getting customers to pay premiums for green power products. Based on the experience of this fund, the gap between willingness to pay studies and actual customer behavior is wide, and insufficient numbers of customers exist to support significant demand for green power. Options being considered in this state include renewable energy purchase mandates and government procurement policies to jumpstart the market.

Integration of Marketing and Education Support with Program Rollout (4). One fund began to hire program staff and rollout programs before bringing the marketing program staff on board, leading to important disconnects and inefficient program rollouts. The lesson: have the marketing staff on board at the same time as the program support staff. Two funds reported that inadequate public education on the benefits of renewable energy is a major barrier in their state. Because the funds' programs are oriented towards the production of renewable energy, there is a risk that insufficient emphasis will be given to educational efforts. One fund reported that using non-profits to engage in the education campaign has been a significant success. Still another fund did not receive as many applications for funding as expected, prompting them to hire a consultant to help market the fund.

The Need for Power Purchase Agreements, and the Role of the State Fund (3). Several fund administrators emphasized the need for long-term power purchase agreements (PPA) to facilitate the development of utility-scale renewable energy projects. One fund administrator acknowledged this to be a significant implementation problem, noting that a sizable number of the projects to which they have offered funding may not be viable if they are unable to obtain a PPA. For future solicitations, the administrator is considering working more closely with local utilities to establish clearer PPA price signals so that projects bidding for incentives will have an earlier gauge for what type of PPA might be available. Another fund manager said that transmission issues have proven to be barrier to bringing renewable energy projects on-line, with this issue proving to be a "black box" for renewable energy companies. This administrator also

said that utility support and advocacy for the renewable energy project is essential to overcome transmission and integration issues.[6]

Developing Markets for Solar Thermal Systems in Retrofit Application (3). After targeting solar thermal systems in building retrofits, one fund found this to be a very tough market to crack. Early projections of costs also proved to be low compared to actual numbers. The fund now recognizes that it probably should have focused on new construction markets. Another fund imposed a requirement that a roof cannot be more than 10-years old, which the fund manager acknowledged to be strongly opposed by the solar thermal industry, but maintained that there are too many abandoned solar thermal systems once a roof is redone. A third fund manager noted that residents still remember the problems with solar thermal systems in the 1980s, when federal tax incentives stimulated demand and a number of high-pressure sales strategies, and are therefore more interested in PV than solar thermal.

Building Markets for Fuel Cells (3). Some fund managers are interested in fuel cells and noted great public interest in and support for fuel cells, but they are scared away by the high cost and relative immaturity of the technology. As noted earlier, managers of relatively small funds were particularly concerned that fuel cells could nearly exhaust the available funding and lessen opportunities for other program investments. Another fund manager also said that the fuel cell industry has been guilty of overselling its technology.

Interest in Small Wind (2). Two fund managers reported different experiences with small wind systems. One of these administrators reported no interest in small wind systems, even though the state has good wind resources. Another administrator had the opposite experience, and after some unsuccessful and costly installations, now requires one year of wind resource data from applicants.

Achieving Success with Bioenergy (2). One fund manager noted that there are multiple bioenergy technologies and applications, and that his fund was overwhelmed by the learning curve it faced in becoming educated about bioenergy. In addition, this fund manager reported that the bioenergy industry is not very strong, making program and funding decisions difficult. A second fund manager said that there are strong biogas opportunities in his state, especially with increasingly stringent state and federal requirements on controlling emissions and run-off from animal farming operations. However, there were several failed biogas installations from a number of years ago that farmers in his state still remember: "everyone knows someone that had a problem" was this person's observation.

Grants to Educational Institutions (2). Two funds reported on the difficulty in funding renewable energy installations at schools. One fund manager reported that such grants should not make the renewable energy installation free for the institution, or the institution would not take the installation seriously, and would expect everything to be done for them. That same manager said that it can be difficult to find the right person in an educational institution to

[6] A fund manager operating in a restructured market, meanwhile, assumed that renewable energy plants would be built as merchant facilities, only to find out that power purchase agreements were essential for renewable energy projects, even in a restructured market.

implement a grant, but that it is critical to find that person if a grant is to be successful. Another fund administrator supported this view and said that such grants will not succeed without support from the school superintendent and the principal. This administrator expressed disappointment with his fund's educational grants and said some will not be renewed.

Loan Programs (2). Two state funds reported that loan programs need to be designed carefully in order to achieve the desired results. One state indicated that getting bank participation in a subsidized loan program is difficult when interest rates are at historic lows. Another fund, however, turned to loans after doing grants for the first year, and wished it had started with loans immediately, as the grant money is not coming back to the fund.

Dealing with Green Tags (1). At least one fund has been exploring its role in the green "tag" market. They have been unsuccessful in finding an appropriate role in this market, however, because there are no clear definitions, standards, or approaches that make this effort viable at this stage. The interviewee noted that much more work needs to be done to accelerate this process and this market.

Establishing Environmental Rankings to Guide Project Awards (1). One state has taken unsuccessful steps to develop a sophisticated environmental ranking of technologies to guide the level of support. This environmental adder approach, based on a life-cycle analysis, proved to be overly complex. Comparisons of water saved or emissions reduced between technology options were difficult to evaluate. Furthermore, the applicants did not understand the process.

Performance-Based Awards (1). One fund cautioned against using capital grants, and based on experience relayed the importance of using production-based awards.

Balancing Aggressive Monitoring Requirements Against the Costs (1). Monitoring of funded renewable energy systems can provide valuable data and be helpful for program oversight. Despite this, one fund noted that its aggressive monitoring requirements have scared off some applicants who saw them as too burdensome – the transaction costs were considered too high.

4. Conclusions

State clean energy funds are experimenting with a variety of innovative approaches to open up markets for renewable energy, educate the public, and help to bring new renewable energy projects on-line. By virtue of their newness, these funds have had to chart a course of action without the help of a clear roadmap for success. In addition, these funds have had to trade off goals of economic development, development of utility-scale renewable energy projects, and market transformation of renewable energy, as well as recognize that individual renewable technologies need different market strategies—one size definitely does not fit all. It should therefore come as little surprise that, in addition to the numerous successes of the funds, there are also some administrative and programmatic challenges to report, and that lessons continue to be learned about how to remedy those pitfalls.

We find that a number of state funds have struggled (to a greater degree than perhaps would be expected) to find a large number of high-quality renewable energy project proposals. This has necessitated a more active approach by funds to search for quality projects and build renewable industry infrastructure.

States have also struggled to identify effective funding mechanisms to create sustainable markets for PV and other distributed generation systems. Difficulties that are frequently cited by the state funds include setting incentive levels without distorting markets; working with industries that are relatively immature and subject to capacity and manufacturing constraints; and overcoming regulatory and institutional barriers such as utility interconnection. In some instances, funds simply opted out of supporting these technologies altogether, for fear that the costs would overwhelm the available funding.

Somewhat similar problems appear to exist for funds attempting to grow the green power market. Several funds reported that it is difficult to garner customer support for purchasing green power, particularly in the residential sector, and one fund noted that initial projections of strong green power demand were overly optimistic. Funds also expressed a need to better integrate program marketing and education support with the rollout of their programs.

On the administrative front, inadequate staffing and staff expertise was the most frequently cited challenge. Apparently, a large number of states are hamstrung with inadequate staffing, and are therefore unable to do their jobs as effectively as one might hope. Those who oversee state clean energy funds may wish to consider devoting additional funding to cover staffing and administrative needs.

States also expressed the need to more closely collaborate with outside stakeholders in the design of their programs, but at the same time noted that funds must often set a different and broader agenda than the one suggested by industry groups. Establishing clear guidance on the allocation of funds across different technologies was identified as a challenge, but also a necessity to minimize ongoing conflict among different stakeholder groups. Collaboration among the state funds, and between the funds and the U.S. DOE, were also noted as essential by some managers. Finally, several states provided examples of the difficulties they experienced in effectively working with their state public utilities commission.

A number of states also expressed deep concerns about the longevity and stability of their funds given possible funding "raids" to cover state budget gaps; state clean energy funds are proving to be tempting targets for governors and state legislatures coping with strapped budgets. Because nascent renewable markets cannot easily withstand uncertainty and stop-and-go funding, continued budgetary threats are likely to be an ongoing concern of state fund administrators

Finally, many states noted challenges in establishing useful metrics and measuring the success of their programs. A tension exists for many clean energy funds between (1) targeting their funds to support the installation of renewable generation capacity in the near term, and (2) focusing their efforts on market transformation activities that are more long-term in nature but could ultimately lead to a more sustainable market for renewable energy technologies. Establishing metrics and measuring the success of "market transformation" efforts has proven especially challenging. More work in this area is clearly needed.

It bears repeating that state clean energy funds are relatively new, and growing pains are to be expected. Additionally, the challenges that have been experienced must be considered in the context of the clear successes achieved by these funds individually and as a group, and we urge readers to review other Berkeley Lab reports that discuss these positive results. These state funds are already beginning to have positive and significant effects on the renewable energy markets in the regions in which they operate. With several years of experience now in hand, state funds are learning from their experiences and rapidly addressing the administrative and programmatic challenges that have arise to date.